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Hamilton Pumphouse

Report by Brian
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BRIAN ARNOTT ASSOCIATES

A REPORT TO
ECONOMIC DEVELOPMENT DEPARTMENT
REGIONAL MUNICIPALITY OF HAMILTON-WENTWORTH
ON THE
HAMILTON PUMPHOUSE (1859)

Brian Arnott Associates

George Baird and Associates, Architects

January 25th, 1982

BRIAN ARNOTT ASSOCIATES

December 4, 1981

Mr. Barry Lord
Wentworth Pioneer Village
Regional Municipality of
Hamilton-Wentworth
P.O. Box 910
Hamilton, Ontario

Dear Barry

The following pages contain our report on the development of the Hamilton Pumphouse (1859) as a heritage and tourist attraction.

Within the limited time and money available, we have tried to touch upon all the issues affecting the possible opening of this attraction to the public in 1982.

We hope that this report will provide you with preliminary order-of-magnitude budgetary figures, a timetable and a "shopping list" for the next steps in the development of this project.

Please be assured that we would be pleased to assist you in any way in carrying out this project.

Yours sincerely
BRIAN ARNOTT ASSOCIATES
GEORGE BAIRD AND ASSOCIATE, ARCHITECTS

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INTRODUCTION

Summary

This study recommends the following:

1. The re-structuring of the existing Wentworth Pioneer Village Historical Advisory Board into an Historical Advisory Board with two sub-sections: one for the Pioneer Village and one for the Pumphouse (page 5.)
2. A division of responsibilities (page 7.)
3. The establishment of Developmental and Restoration Standards (page 7.)
4. A 1982 season of organized tour access and phasing of the project for a general public opening in 1983. (page 18.)
5. Development of operations and programming and restoration of the Pumphouse in Phase 1 (page 20.)
6. Improvements to the site over time.
7. The conversion of the Boiler Room for exhibit purposes in Phase 2 (page 20.)
8. The undertaking of a market analysis (page 22.)
9. The development of an exhibit concept in Phase 1 (page 24.)
10. The undertaking of research, planning and design for the interpretive exhibit in Phase 1 (page 25.)
11. The construction and installation of the interpretive exhibit in Phase 2 (page 36.)
12. The study also provides cost estimates for Phase 1 (pages 29-31.) and cost projections for Phase 2 (page 34-35.)

Background

OBJECTIVE OF THE REPORT

This report has been prepared to assist the Regional Municipality of Hamilton-Wentworth in determining the potential of the Hamilton Pumphouse (1859) as a heritage and tourist attraction. In particular, the report addresses itself to the question of whether the Pumphouse should be opened to the public in the summer of 1982.

LONG RANGE GOALS

The report assumes that the Municipality's long range goals are

- to complete a faithful restoration of the Pumphouse and to bring its engines back to their original operating condition;
- to create an interpretive exhibit in the former Boiler Room;
- to open the completed complex to the public;
- to operate an interpretive program which shows the place of the Pumphouse in the industrial and civic development of Hamilton-Wentworth;
- to maintain a high educational and historical standard in the interpretive program;
- to take advantage of the tourist potential represented by the site's location on the Q.E.W. corridor.

It is understood that the Woodshed (ca.1860) which lies to the west is to considered as part of the Pumphouse complex for planning purposes.

It is further understood that the Pumphouse may be the first stage of an industrial museum for Hamilton and could eventually include both the Pumphouse and auxiliary buildings on this site.

SIGNIFICANCE OF PUMPHOUSE TO HAMILTON-WENTWORTH

The Pumphouse is both an artifact and a milestone in Hamilton's industrial and social development. As an artifact the Pumphouse is unique in North America as the only one of its era and type operating on the original site. It is both an architectural and engineering monument of national significance and, as such, must be maintained and shown with scrupulous attention to historic authenticity. Because of its status as a national monument, expert advice should be sought and carefully followed in matters of building and equipment conservation, restoration and repair.

As a milestone in Hamilton's development, the Pumphouse provides the opportunity not only to display a unique building and engine but also to describe to visitors

- why the Pumphouse was required;
- what impact it had on Hamilton's growth;
- what personalities were involved;
- how it works.

The opening of the Pumphouse together with an associated exhibition area would constitute an important educational resource touching subjects such as physics and engineering, civic politics, urban planning, architectural history and resource management.

DEVELOPMENT PLANNING

Administrative Development

ADMINISTRATIVE STRUCTURE

The Pumphouse is owned and maintained by the Regional Municipality of Hamilton-Wentworth. The Regional Council's Engineering Services Committee currently has full responsibility for the building and its equipment.

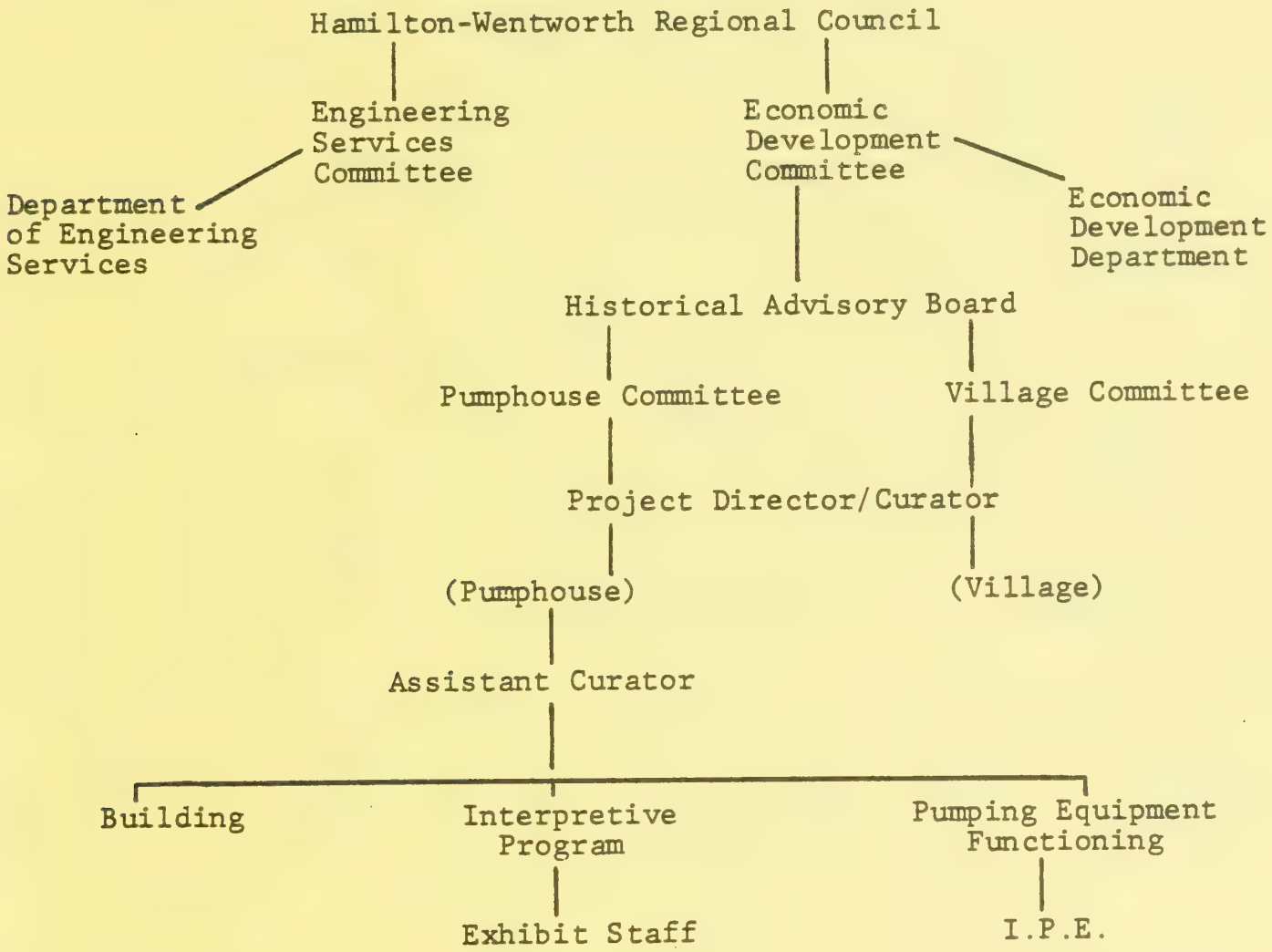
The proposed structure for the development and operation of the building as a heritage and tourist attraction would retain Engineering Services' traditional responsibilities for the plant and site but would not extend its responsibility to the public program.

Responsibility for the public program would be taken up by the Economic Development Committee who would entrust the Wentworth Pioneer Village Historical Advisory Board with project development and program operations. The Historical Advisory Board would be reconstituted with separate sub-sections for the Pioneer Village and the Pumphouse. The Historical Advisory Board would retain its traditional responsibilites for the establishment and maintenance of policies for the two sites. The present Pioneer Village curator would assume additional responsibilites as Project Director/ Curator of the Pumphouse. An Assistant Curator would also be assigned to the Pumphouse project.

Responsibility for setting and maintaining standards for conservation and interpretation should be given the the Project Director/Curator who will prepare written specifications, under the direction of the Historical Advisory Board, with the assistance of qualified professional consultants. Specifications for the building and engine restoration work which is now underway will have to be written

as soon as possible and work sould no otherwise proceed without the approval of the Project Director/Curator.

PUMPHOUSE ADMINISTRATIVE STRUCTURE



DIVISION OF LABOUR AND SERVICES

Under this structure, the division of labour and services would be:

Historical Advisory Board (Pumphouse Sub-Committee)

- . provide project direction
- . set and maintain all standards and policies
- . recruit and engage senior staff
- . engage professional consultants

Engineering Services

- . provide site development and maintenance
- . provide building improvements, restoration and maintenance
- . provide engine maintenance

Economic Development

- . provide Project Director/Curator
- . provide research, planning and design services
- . provide exhibit fabric and related materials
- . operate public program

Institute of Power Engineers

- . under take engine restoration
- . undertake engine operation

ESTABLISHMENT OF OBJECTIVES AND STANDARDS

Prior to the beginning of any further work, a statement of objectives and standards will need to be prepared by the Project Director/ Curator for the information and concurrence of all parties. The statement will cover Objectives for

- . future development
- . interpretive program
- . market penetration

This statement will also cover Standards for

- . building restoration and maintenance
- . equipment retoration and maintenance
- . exhibits, displays, and publications.

Site Development

SITE CONTEXT

The Keefer/Gartshore Pumphouse is located close to the edge of Lake Ontario, at the intersection of Woodward Avenue and Burlington Street. The Queen Elizabeth Way passes between it and the Lakeshore, and the interchange from the Queen Elizabeth Way to Burlington Street closely abuts to the Waterworks property.

As a result, the Pumphouse is highly visible from Woodward Avenue, reasonably visible from Burlington Street, but only moderately so from the QEW. The building is now floodlit, but the systems are inadequate to light the entire ensemble, missing both the roofs, the east facade, and the top of the stack. Hence even the existing floodlighting does not help visibility from the QEW to any great extent.

Since the newly located purification plant blocks any view of the Pumphouse from the northbound QEW, it is recommended that visibility from this vantage point be abandoned. From the southbound QEW, however, a reasonably good view could be had, were the floodlighting of the existing building to be improved.

Recommendations:

- negotiate permission from Ministry of Transportation and Communication for identifying signs on the QEW itself.
- improve floodlighting to building, as noted below.

SITE PLAN

The Pumphouse is an integral part of the existing Hamilton Waterworks, all enclosed within the distinctive fencing which encircles the entire complex. Entry now occurs through the north entrance off Woodward Avenue. The historical ensemble of buildings now comprises the Pumphouse itself, its Boiler Room and stack, as well as the adjacent Woodshed, which has been partially enclosed. Immediately to the east lies the 1913 Waterworks building which may become part of the historical ensemble at a later date.

PREFERRED VISITOR ORIENTATION

The site plan on page 13 shows a vehicular loop, bus lay-by and car parking to the west of the Woodshed. This arrangement provides both the possibility of using the Woodshed as an orientation centre and the most appropriate direction for the public approach to the Pumphouse. The presence of existing services in this area may require amendments or revisions to this particular arrangement once further investigation is made.

RECOMMENDATIONS

- retain access through north Woodward Avenue entrance, but provide major new signage here.
- investigate siting options for new vehicular loop road and provide drop off to proposed new orientation centre at Woodshed.
- provide new 40 car parking lot near vehicular loop road, screened by trees.
- provide new 2 bus lay-off loop road.

- provide continuous screen of shrubbery between historical ensemble and Waterworks to the south and east, while retaining high visibility of historical ensemble from the west and north.
- provide new security fencing to south and east, to delineate historical site from the balance of the Waterworks property.
- provide new path system from parking lot to orientation pavilion (Woodshed) and then to the Pumphouse and Boiler Room.
- develop open area to the north of the Pumphouse for picnicing and casual recreation.
- provide discrete system of site signage to orient visitors to historical buildings and to the preferred route to visit.
- provide pole-mounted high-intensity floodlighting to the Pumphouse, Boiler Room and stack, from the west, north and east.

N.B.

- handicapped access to the Pumphouse proper will only be provided by elevator access to the main floor from the refurbished Boiler House.
- investigate funding for handicapped access.
- determine status of Pumphouse regarding Part Five of Ontario Building Code.

CONTEXT PLAN

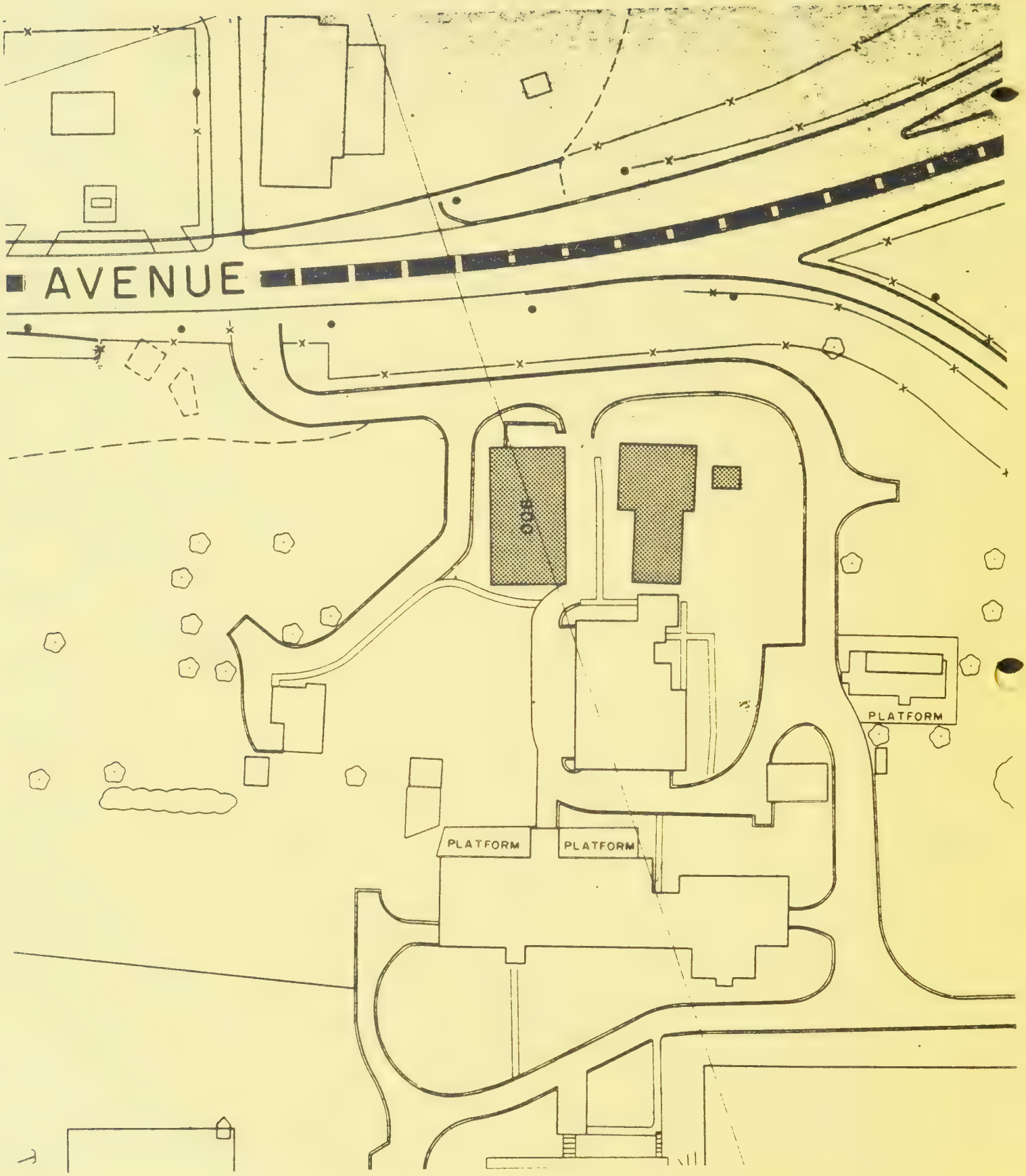
KEEFER / GARTSHORE PUMP HOUSE

HAMILTON WATERWORKS

FEASIBILITY STUDY

DECEMBER 1981

1" = 400'



EXISTING SITE PLAN

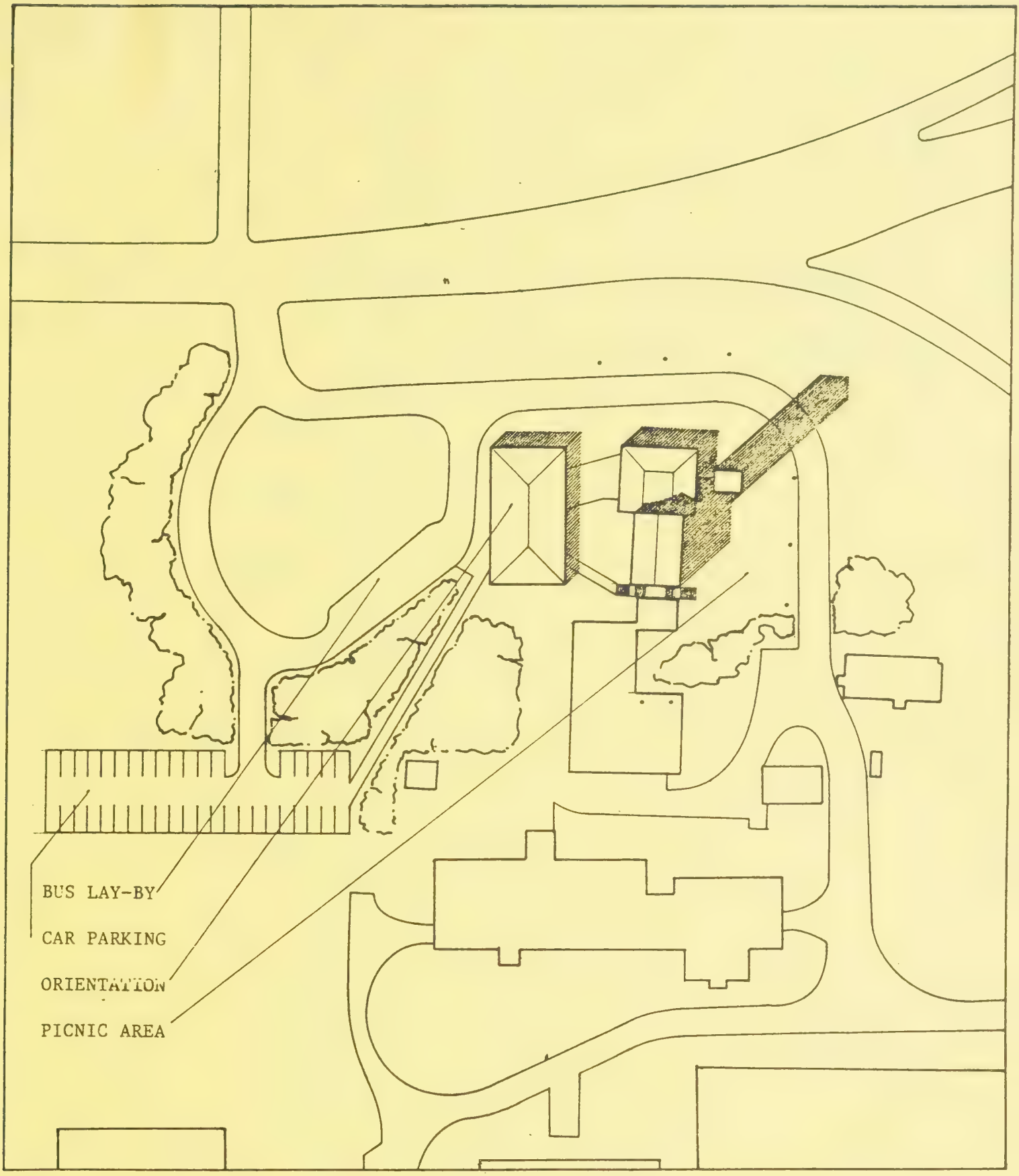
KEEFER / GARTSHORE PUMP HOUSE

HAMILTON WATERWORKS

FEASIBILITY STUDY

DECEMBER 1981

1" = 100'



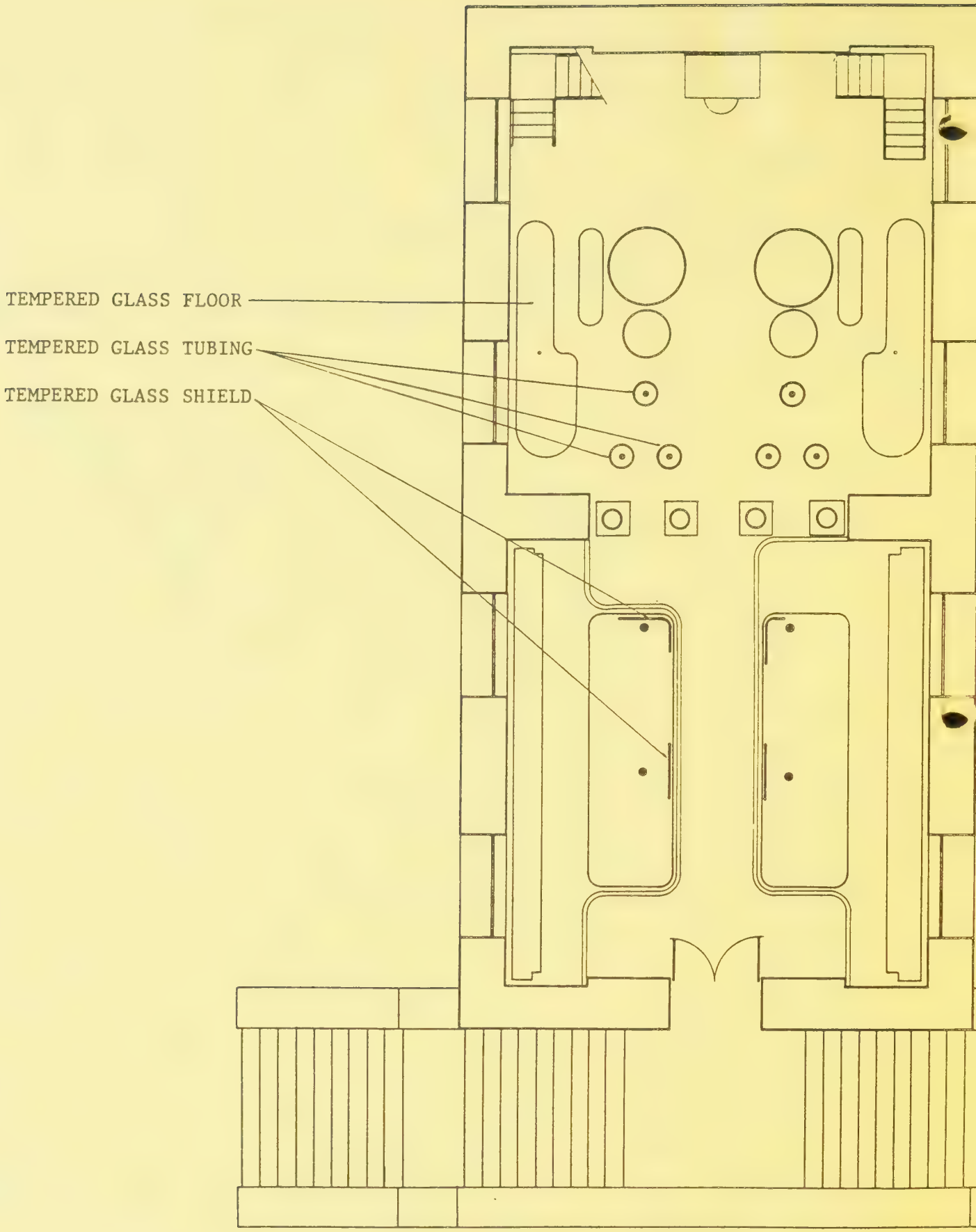
PROPOSED SITE PLAN

KEEFER / GARTSHORE PUMP HOUSE

HAMILTON WATERWORKS

FEASIBILITY STUDY DECEMBER 1981

1" = 100'



MAIN FLOOR PLAN

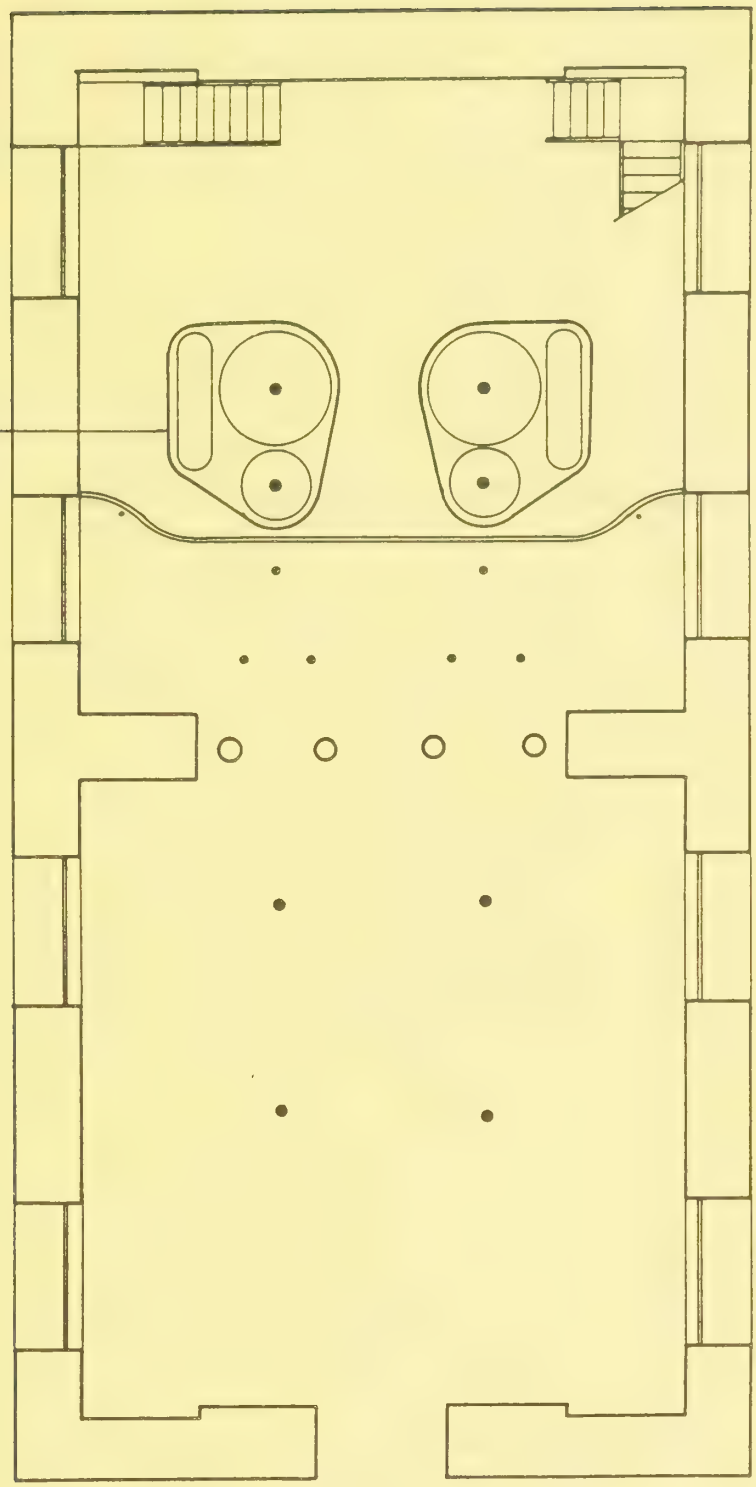
KEEFER / GARTSHORE PUMP HOUSE

HAMILTON WATERWORKS

FEASIBILITY STUDY

DECEMBER 1981

1/8" = 1'-0"



MEZZANINE PLAN

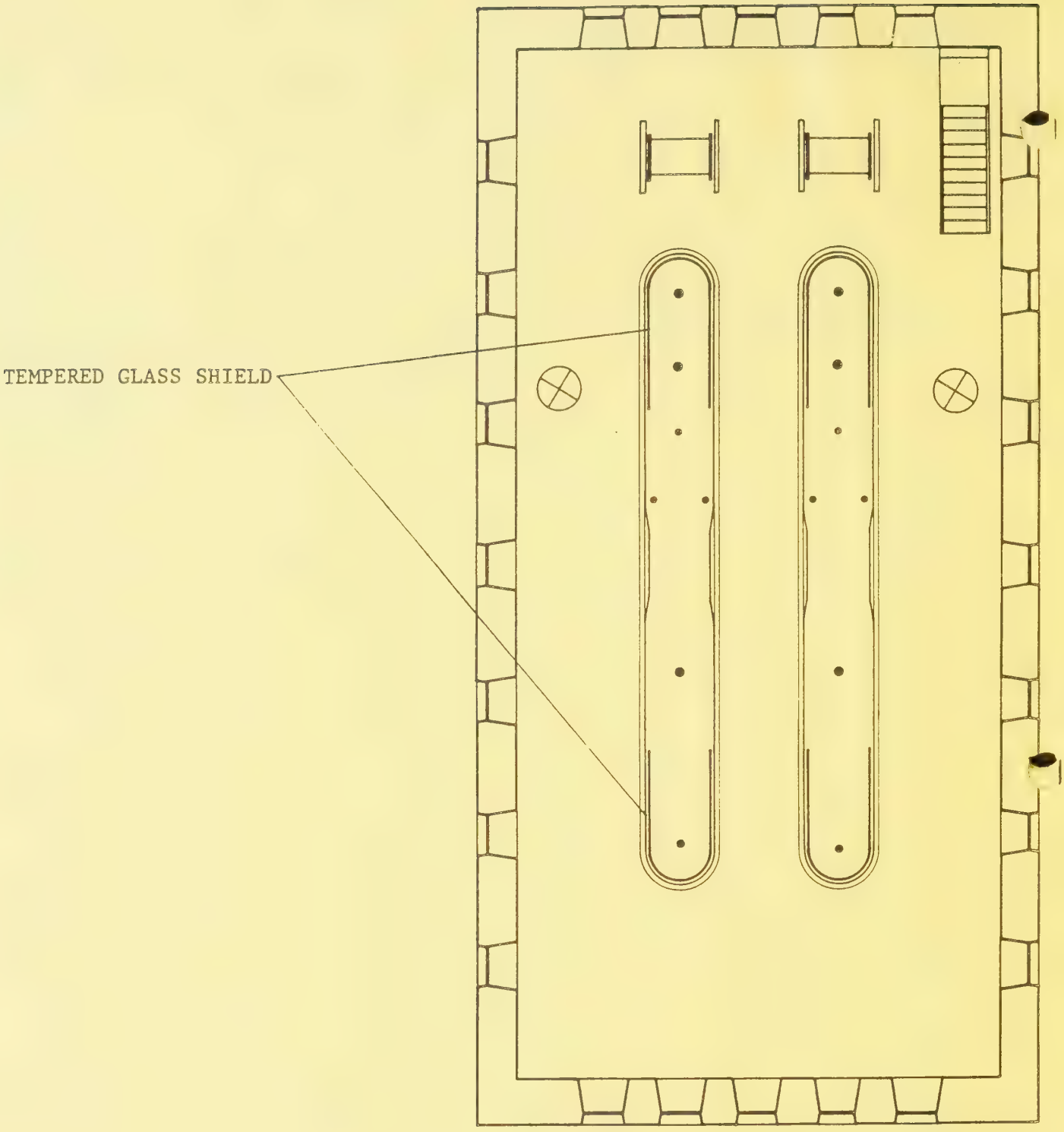
KEEFER / GARTSHORE PUMP HOUSE

HAMILTON WATERWORKS

FEASIBILITY STUDY

DECEMBER 1981

1/8" = 1'-0"



THIRD FLOOR PLAN

KEEFER / GARTSHORE PUMP HOUSE

HAMILTON WATERWORKS

FEASIBILITY STUDY

DECEMBER 1981

1/8" = 1'-0"

EQUIPMENT RESTORATION STANDARD

Technical Considerations

The Institute of Power Engineers has put a great deal of effort into the restoration of the pumping equipment and into the identification of policy issues for the operation of this equipment.

Despite the obvious attractiveness of the pumping mechanism in a static position, this equipment can be made operational with minor repair work and there can be little argument with the proposition that if it can move, it should move.

Movement does, however, mean that a licensed 4th class engineer needs to be present and that there is a substantial increased concern for public safety. This concern for public safety will need to be reflected in sensitively designed safety barriers throughout the building and supervision of the public by guides on all floors to which the public has access.

The Institute of Power Engineers has also outlined the work which is required to make one engine operative on atmospheric steam for public display in the summer of 1982. However, on the assumption that both engines must be fully restored (mechanically and cosmetic) to condensing steam prior to the public opening, the Institute of Power Engineers should be given a mandate, a budget, a timetable and specifications for the full renovation which they are both able and eager to carry out. The Institute of Power Engineers would work under the direct supervision of the Project Director/Curator.

OPENING IN 1982

The question of opening this attraction in 1982 is related to the following considerations:

1. That the Pumphouse building and pumping engines be fully restored without compromise. This is an objective which is possible to meet but it does not seem advisable to establish an arbitrary deadline. Progress toward this objective will be contingent upon availability of funds in any given year.

2. That the public experience should be as complete as possible in the interest of good public relations and future audience development. Ideally the visitor should see an organized site, a working pumphouse, and interpretive exhibit which ties the whole story together.

3. That the development of an interpretive exhibit and the improvements to the existing Boiler Room to accommodate this exhibit would take roughly 15 months. If planning and design were to begin early in 1982 the Boiler Room exhibit could therefore be ready for the 1983 season.

4. That the Pumphouse should remain available to special interest groups and some pre-arranged tours. No trained guides would be hired for 1982. An Assistant Curator would be hired at mid-year. The 1982 visitors may be seen as a market sample and planning test group.

5. That the emphasis in the first phase should be put on operations development, restoration of the Pumphouse and its engines, and research and planning for the Boiler Room exhibit. This work would constitute Phase 1.

6. Phase 2 would consist of the improvements to the site, the Boiler Room and ancillary area and the production and installation of the interpretative exhibit and related materials. This phase could begin as early as late 1982.

7. A Phase 3 development might begin any time after 1984 or 1985.

RECOMMENDATIONS - IMMEDIATE STEPS

In order to meet the requirements of a full public opening in the summer of 1983, the following sequence of administrative development steps will be required to be completed in early 1982.

- approve restructure of existing Historical Advisory Board
- designate Project Director/Curator
- draft statement of objectives and standards
- finalize planning budget for 1982
- approve engaging architectural and exhibit consultants to begin preparation of market study, exhibit research, specifications for building and engine restoration.

Phasing

PHASING OF CONVERSION OF PUMPHOUSE AND RELATED BUILDINGS TO MUSEUM OF TECHNOLOGY

It is anticipated that the conversion of the historical ensemble to a museum of technology will occur as a multi-year development over roughly a decade. This development could be broken into the following phases:

Phase 1

1.a. Administrative development; Exhibit and operations development

1.b. Restoration of existing Pumphouse (mechanical and architectural)

Phase 2

2.a. Additional safety elements to existing Pumphouse to allow for public access
Provision of site works, new roads, landscaping, parking, exterior illumination, etc.

2.b. Development of Boiler Room as interpretive centre

2.c. Development of Woodshed as orientation pavilion

Phase 3

3.a. Conversion of auxiliary buildings to full-fledged museum use.

More detailed notes on Phasing follow.

PHASE 1

Exhibits and Operations

MARKET ANALYSIS

As a first step in operations planning, a market analysis will be required to provide information to assist site planning, exhibit development and the interpretive program. A market analysis should provide both order-of-magnitude revenue projections for Phase 2 as well as form a basis of a strategy for selling the attraction. The market information will also enable decisions to be made regarding certain front-end costs such as the development of promotional, educational and sales materials.

The market analysis should address itself to the following:

- tourist visitation
- local visitation
- school visitation
- special interest groups
- bus tours
- length of season
- hours of opening
- load profile (daily & seasonal)
- admission rates

The market analysis should also consider:

- visitor potential from the Q.E.W. corridor
- relation to Confederation Park and Fifty Point
- relation to existing industrial attractions (Stelco, Dofasco, Proctor and Gamble)
- proposed nearby attractions of the Q.E.W. corridor

The following options are available for determining the time when the Pumphouse attraction may be open to the public:

- year round (longest season)
- mid-spring to mid-fall
- summer/tourist season
- by appointment (shortest season)

Of these options, the summer/tourist season is clearly the safest and shortest. Before making a final decision on the length of the season beyond this option, market testing is advisable. Serious consideration whould also be given to the full potential of the school market in Hamilton-Wentworth, Niagara, and Halton in particular.

On the basis of available information and experience in other attractions of this type, the option which would appear at this time to represent the best opportunity and the least risk for Phase 2 would be "mid-spring to mid-fall" which could cover both the tourist and school market.

Visitor Capacity

On the basis of available information and the nature of the Pumphouse itself, it is assumed that the site would not be capable of sustaining a visitor load of more than 100 persons per hour.

If the site were to be open for 8 hours per day on a 7 day week basis, the following range of attendance would apply.

% of capacity	people per day	May through October (182 days)	June through September (126 days)
100%	800	145,600	100,800
80%	640	116,480	80,640
60%	480	87,360	60,480
40%	320	58,240	40,320
20%	160	29,120	20,160

Revenue From Visitors

Visitor revenue estimates can be derived from the percentage of the anticipated visitors who will pay

- full admission
- group rate admission
- reduced admission (seniors, children)

Additional revenues will be derived from the sale of educational and other materials on the site.

Cost of Operations

Since it is anticipated that all the costs of the operation of the attraction may not be met by the gate and sales receipts, first priority should be given to applying gate and sales receipts to the interpretive program, namely

- administration and curatorial
- site specific promotion
- staff (guides, sales)
- staff (engineer)
- daily custodial

Front-end costs for other items related to the interpretive program (uniforms, sales outlet inventory, etc.) would be funded independently.

EXHIBIT CONCEPT AND PHYSICAL DEVELOPMENT

Following the completion of the market survey, the Project Director, the exhibit designers and the project architect will need to establish a general concept for the Boiler Room exhibit. This concept will be

based upon preliminary research by the designers and will address the following issues

- . treatment of the building (C.C.I. standards; other options)
- . general space allocation
- . exhibit media and artifacts
- . exhibit systems

General agreement will need to be reached on these issues prior to planning any upgrading of the Boiler Room as an exhibition area for a public opening.

THE INTERPRETIVE EXHIBIT DEVELOPMENT

The interpretive exhibit should set the Pumphouse into its context and show

- . relation to similar technologies
- . local need
- . personalities behind the project
- . how it works
- . what effect it had on the Hamilton area
- . why it was unique in Canada West 1859
- . why it is important today

It should be assumed that much, if not all, the exhibit area in the Boiler Room will be given over to this "one-time" installation which will be built specifically to compliment the Pumphouse experience. The exhibit should have a minimum life of 5 years, maximum of 7 years. The Boiler Room will therefore require only a limited service area.

Exhibit development will occur in the following sequence.

Graphic Standards Manual

The first step in the development of the interpretive exhibit will be the creation of a Graphic Standards Manual which will be also be used to establish the visual format for promotional materials, signage and labelling and publications. The Manual will cover type, layouts, paper stock, etc.

Collect and Collate Research Materials

The next step will be to produce a Historic Manual for the guides. This Manual will contain both text and photos, primary and secondary sources. The Historic Manual will be the authorized story of the Pumphouse.

Develop Story Line

The main themes and sub-themes will be developed from the Historic Manual. Thematic material will be developed for presentation via photo, text, artifact, model, film or slide, audio loop, or other medium.

Design Exhibit

The story line will then be expressed in a floor plan. Drawings and specifications are prepared for each unit. Artifacts and other materials are collected.

Construction and Installation (Phase 2)

Exhibit units are constructed and installed on-site.

Exhibit Development Timetable

The following are the minimum time requirements for exhibit development.

Graphic Manual	1 month
Historic Manual	2 months
Story Line	2 months
Design	4 months
Construct and install	4 months
	13 months

The cost of research, planning and design of the interpretive exhibit will be included in the Phase 1 budget. The design portion of these costs will vary depending upon the complexity of the exhibit media but these costs may be estimated at 15% of the total exhibit package. Research and planning costs will be in the range of $10,000 - $15,000.

BUILDING RESTORATION

Exterior

The structure of the existing Pumphouse is in relatively good condition. The only identified problems relating to the building shell are as follows:

- some moisture in the lowest level of the structure
- some corrosion of the steel beams supporting the main entry slab
- some cracking of the masonry walls just below the roof bearing level

N.B It is important to note that a full structural engineering assessment of the building's condition has not been made a part of the work of this study. The above remarks are the result of a preliminary structural review conducted by Waterworks staff.

Recommendations

- install sump pump at low level
- reinforce steel beams to underside of entry slab
- repoint and chemically clean all exterior masonry
- repaint all existing wood trim

Interior

Like its shell, the interior of the Pumphouse is in relatively good condition.

Recommendations

- complete mechanical restoration of pumps and repaint throughout
- insert tempered plate glass panels to floor as shown on drawings
- repair and refinish existing oak flooring on all three levels
- repaint entire interior
- refinish existing natural finish wood

Phase 1 Pumphouse Restoration Cost Estimates

Substructure	- install sump pit including pit, cover, pump, discharge piping & wiring - reinforce steel beams on underside of entry - Repair steel framed wood deck plan of upper level - make good roof structure	$8,700.00
Exterior Cladding	- make good roof finish - repair to roof overhang details - clean, repoint and repair brick - clean and paint steel sash - clean and paint entry door & frame	19,000.00
Interior Partitions and doors	-	0
Vertical Movement	- repair and refinish existing oak stairs and wood and steel handrails	4,400.00
Interior Finishes	- refinish existing oak floors & tops of exposed steel beams - refinish underside of roof, upper floor and mezzanine - clean, repaint, repair and whitewash interior brick walls	25,100.00
Fittings and Equipment	- paint for pump & machinery - tempered glass floor - signage	8,200.00

Services - upgrading of electrical, lighting and heating systems		9,000.00
Site Development -		0
Overhead and Profit - site overhead - contractor's overhead & profit		20,000.00
Contingencies - escalation - design - post-contract		17,000.00
	Sub-total -	111,400.00
Architectural Fees -		13,400.00
	TOTAL	$124,800.00

PHASE 1 COST ESTIMATES SUMMARY

PHASE 1 a

Administrative Development	Phase 1a	
. Staff	15,000.	
. Communications (re-visitor development)	3,500.	
. Advertising and Publicity	1,000.	
. Office supplies and stationary	500.	
. Travelling and expenses	1,000.	
. Membership and subscriptions	250.	
. Training and subscriptions	500.	
. Conferences, conventions	1,000.	
		22,750.
Exhibit and Operations Development		
. Staff (training and development)	2,500.	
. Market Study	5,000.	
. Exhibit research planning	15,000.	
. Exhibit related materials planning (graphics and publications)	3,500.	
		26,000.

PHASE 1 b

Physical Development		
. Site Development	N/A	
. Pumphouse restoration	111,400.	
. Equipment restoration	20,000.	
. Boiler Room renovation	N/A	
. Woodshed renovation	N/A	
. Phase 1 planning and design (architectural fees)	13,400.	
		144,800.

PHASE 2

Buildings

BUILDING RESTORATION

In Phase 2, it is proposed to convert the existing Boiler Room to an interpretive centre, and to convert the existing Woodshed to an orientation centre. At this time, supplementary shields and railings would be added to make it publicly accessible. At the same time, an elevator would be provided in the Boiler Room, for handicapped access to the main floor only of the Pumphouse; conditional upon available funds. The site work indicated above would also be done at this time.

Detailed recommendations follows:

Recommendations

- convert Boiler House to interpretive centre
- convert Woodshed to orientation centre
- undertake site work as shown on drawings
- add supplementary railings to staircase and balustrades, and protective tempered plate glass shields at Pumphouse.
- add illumination to mechanical elements of pumps which are below main floor level.

PHASE 2 COST ESTIMATES

The Phase 2 cost estimates shown on the following pages have been prepared as a package which might be undertaken as early as 1983. Cost estimates for discrete elements (e.g. Woodshed) may be extrapolated from this package. Cost estimates for work beyond 1983 will need to have inflation added.

PHASE 2 (Architectural) COST ESTIMATES

	Amount	Unit Price	Total
Convert existing gutted Boiler House for interpretive centre	2000 sf	100.00	200,000.
Handicapped elevator, approximately 24' lift to main Pumphouse floor including new doorway	1 no	55,000.00	55,000.
Convert existing Woodshed to orientation centre			
- exterior space	3000 sf	25.00	75,000.
- interior space	2000 sf	80.00	160,000.
Add supplementary railing to stair case and balustrades and protective plate glass shield to Pumphouse	1s		46,400.
Illuminate pump equipment below main floor	1s		2,500.
Site Works			
Remove existing paving	15000 sf	.10	1,500.
Remove top soil for new paving	24340 sf	.05	1,217.
Cut & fill for new paving	24340 sf	.20	4,868.
New roadway	6800 sf	1.00	6,800.
New parking lot	13200 sf	.90	11,880.
Re-surface existing roads	12500 sf	.35	4,375.
No curbs to road	-	-	-
P.C. concrete curbs to parking lot	400 lf	5.00	2,000.
Parking lines- arrow	1s		400.
Interlocking stone foot path	4340 sf	3.00	13,020.

Develop picnic area- allowance		1s		2,500.
Landscaping & planting- allowance		1s		15,000.
Signage- exterior		1s		8,000.
Security fencing, chain link 8' high	1400	lf	15.00	21,000.
Exterior flood lighting pole mounted high intensity	8	no	2000.00	16,000.
				$647,460.
General contractor's site overhead				75,000.
General contractor's head office overhead and profit				40,000.
Design contingency				40,000.
Escalation contingency- (to June 1, 1983 - 17%)				100,000.
Post contract contingency				40,000.
			Sub total	942,460.
Architectural fees				92,000.
			Total	$1,034,460.

Exhibits

EXHIBIT COMPLETION AND COSTS

The exhibit components will be contracted, built, installed and paid for in Phase 2. Depending upon the complexity of the exhibit media these costs will run between $75 and $150 per net square foot of exhibition space. Assuming a net exhibition area of 1500 square feet, this would require between $112,500 and $225,000 (including design costs).

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